REMARKS

Claims 1, 2, 4-10, 13-32 and 34-48 are pending in the present application. In the Office Action dated October 21, 2003, the Examiner rejected claims 1, 2, 4-10, 13, 14, 17-23, 26, 27, 29-32, 34, 35 and 37-44 under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 3,710,251, to Hagge et al. ("Hagge") in view of U.S. Patent No. 5,474,877, to Suzuki et al. ("Suzuki"). Additionally, claim 15 was rejected as unpatentable under 35 U.S.C. § 103(a) over Hagge in view of Suzuki, and further in view of U.S. Patent No. 6,073,681, to Getchel et al. ("Getchel"). Furthermore, claim 16 was rejected as unpatentable under 35 U.S.C. § 103(a) over Hagge in view of Suzuki, and further in view of U.S. Patent No. 4,432,635, to Mayer ("Mayer"). The Examiner also rejected claims 24 and 36 as being unpatentable under 35 U.S.C. § 103(a) over Hagge in view of Suzuki, and further in view of U.S. Patent No. 5,578,127, to Kimura ("Kimura"). Finally, claims 25, 28 and 45-48 were rejected as unpatentable under 35 U.S.C. § 103(a) over Hagge in view of Suzuki alone. Applicant disagrees with these grounds of rejection and wishes to clarify various distinctions of applicant's invention over the cited art. Reconsideration of the invention is therefore requested in light of the following amendments and remarks.

The disclosed embodiments of the invention will now be discussed in comparison to the prior art. Of course, the discussion of the disclosed embodiments, and the discussion of the differences between the disclosed embodiments and the prior art subject matter, do not define the scope or interpretation of any of the claims. Instead, such discussed differences are offered merely help the Examiner appreciate important claim distinctions as they are discussed thereafter.

As a preliminary matter, applicant notes that the PTO-1449 from the Information Disclosure Statement filed August 7, 2001, has not been returned. The Examiner is respectfully requested to initial and sign the PTO-1449 and to return it to the undersigned attorney.

Applicant teaches methods for controlling a temperature of a microelectronic substrate during application of a liquid to the substrate. In one embodiment, a method includes disposing the liquid on a first surface of the substrate, rotating the substrate to distribute the liquid over the first surface of the substrate, and directing a fluid flow directly against the second surface of the substrate to control a temperature of the first surface of the substrate. Alternately,

the fluid flow may include first and second fluid flows that may be directed to first and second portions of the substrate, respectively, to provide first and second heat transfer rates to the first and second portions. In further embodiments, the fluid flow may comprise compressed air, and the liquid may comprise a liquid resist material. The methods taught by applicant advantageously allow the temperature of the substrate to be controlled during the application of the liquid, by directing fluid flows toward the substrate that directly impinge on a surface of the substrate.

The Examiner cites the Hagge reference. Hagge discloses a microelectronic heat exchanger pedestal for supporting a microelectronic chip during testing. As pointed out specifically in col. 1, lines 12-40, it is important to electrically test microelectronic circuit wafers at both elevated and depressed levels relative to an ambient temperature. Referring now to Figure 1, the disclosed apparatus for testing a wafer will be described further. The apparatus includes a pedestal 10 that includes a top surface 14 and a plurality of tube pins 16 that extend through the top surface 14 that are coupled to a vacuum source that is connected to the tubular line 13. A wafer 11 is retained on the top surface 14 by means of the vacuum that is communicated to the wafer 11 through the tube pins 16. In order to test the wafer 11 under different temperature conditions, a gas may be delivered to the underside of the top surface 14 under prescribed flowrate and temperature conditions in order to provide the desired temperature at the wafer 11, as required by the test. The reference does not disclose that the flow is an impinging flow, and in particular, the flow cannot directly contact the wafer 11 since the gas is separated from the wafer 11 by the top surface 14. As a consequence, heating and/or cooling of the wafer 11 by the gas generally occurs less quickly than would be afforded by a flow that directly impinged on the wafer 11.

The Suzuki reference, also of record in the present application, discloses a resist pattern developing apparatus having a rotating holder 12 for supporting a substrate 11 that is to be coated with the resist material. Although the Suzuki reference discloses a heating element 13 (see, for example, Figure 1 of Suzuki) for applying heat to the substrate 11 while the resist pattern is developed on a surface of the substrate 11, Suzuki does not disclose at least one fluid stream that may be directed against a surface of the substrate, so that portions of the substrate may be selectively heated and/or cooled.

Accordingly, applicant respectfully asserts that Hagge and Suzuki, either singly or in combination fail to disclose or suggest the disclosed invention. In particular, both Hagge and Suzuki fail to disclose or fairly suggest at least one fluid stream that may be directed to a surface of a substrate to selectively heat and/or cool the substrate.

Turning now to the claims, patentable differences between the claims and the applied references will be specifically pointed out. Claim 1, as amended, recites in pertinent part: "An apparatus for controlling a temperature of a microelectronic substrate, the substrate having a first surface and a second surface opposite the first surface, the apparatus comprising...a temperature controller positioned at least proximate to the substrate support, the temperature controller having a first thermal link coupled with a first portion of the substrate and a second thermal link coupled with a second portion of the substrate, the first and second thermal links being separately controllable for transferring heat to or from the first and second portions at different rates, *wherein the first thermal link comprises a first nozzle configured to direct a first fluid stream toward the first portion of the substrate, and the second thermal link comprises a second nozzle configured to direct a second fluid stream toward the second portion of the substrate.* (Emphasis added). As discussed more fully above, neither of the applied references disclose or suggest this. Claim 1 is therefore allowable over the cited art. Claims depending from claim 1 are also allowable based upon the allowable form of the base claim and further in view of the additional limitations recited in the dependent claims.

Claim 26, as amended, recites in pertinent part: "An apparatus for controlling a temperature of a microelectronic substrate, the substrate having a first surface and a second surface opposite the first surface, the apparatus comprising...a temperature controller coupled to a source of gas, *the temperature controller having at least one orifice proximate to the substrate support for directing an flow of the gas through the at least one orifice that directly impinges against the second surface of the substrate.*" (Emphasis added). Again, the applied references simply do not disclose or suggest this. Claim 26 is also therefore allowable over the cited art. Claims depending from claim 26 are also allowable based upon the allowable form of the base claim and further in view of the additional limitations recited in the dependent claims.

Claim 37, as amended, recites in pertinent part: "An apparatus for controlling a temperature of a microelectronic substrate, the substrate having a first surface and a second

surface opposite the first surface, the apparatus comprising...a temperature controller positioned at least proximate to the substrate support and being generally fixed relative to the substrate when the substrate is supported by the substrate support, the temperature controller having a first thermal link coupled directly with a first portion of the substrate and a second thermal link coupled directly with a second portion of the substrate, *the first and second thermal links being separately controllable for directing a first fluid stream and a second fluid stream to the respective first and second portions of the substrate to transfer heat to or from the first and second portions of the substrate at different rates.*" (Emphasis added). Neither the Hagge reference nor the Suzuki reference disclose or suggest this. Claim 37 is allowable over the cited art. Claims depending from claim 37 are also allowable based upon the allowable form of the base claim and further in view of the additional limitations recited in the dependent claims.

Claim 45, as amended, recites in pertinent part: "An apparatus for controlling a temperature of a microelectronic substrate having a first surface and a second surface opposite the first surface, the apparatus comprising...a first temperature controller proximate to the first substrate support to transfer heat to or from the substrate while the substrate is engaged by the first substrate support in a generally stationary position relative to the first temperature controller, the first temperature controller having a first thermal link coupled directly with a first portion of the substrate and a second thermal link coupled directly with a second portion of the substrate, *the first and second thermal links being separately controllable for transferring heat to or from the first and second portions at different rates by impinging a first fluid stream and a second fluid stream against respective first and second portions of the substrate*...a second temperature controller proximate to the second substrate support to transfer heat to or from the substrate while the liquid material is applied to the substrate and while the substrate rotates, the second temperature controller having a third thermal link directly coupled with the first portion of the substrate and a fourth thermal link directly coupled with the second portion of the substrate, *the third and fourth thermal links being separately controllable for transferring heat to or from the first and second portions at different rates by impinging a third fluid stream and a fourth fluid stream against respective third and fourth portions of the substrate*..." (Emphasis added). Clearly, neither Hagge nor Suzuki disclose this. Claim 45 is now allowable over the cited art. Claims depending from claim 45 are also allowable based upon the allowable form of

the base claim and further in view of the additional limitations recited in the dependent claims. Claim 6 is cancelled without prejudice.

With respect to the Examiner's other rejections under 35 U.S.C. § 103(a) based upon the combination of Hagge and Suzuki in view of still other references, applicant respectfully asserts that the foregoing amendments also overcome these rejections.

All of the claims remaining in the application are now clearly allowable. Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,
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